

FIG. 1

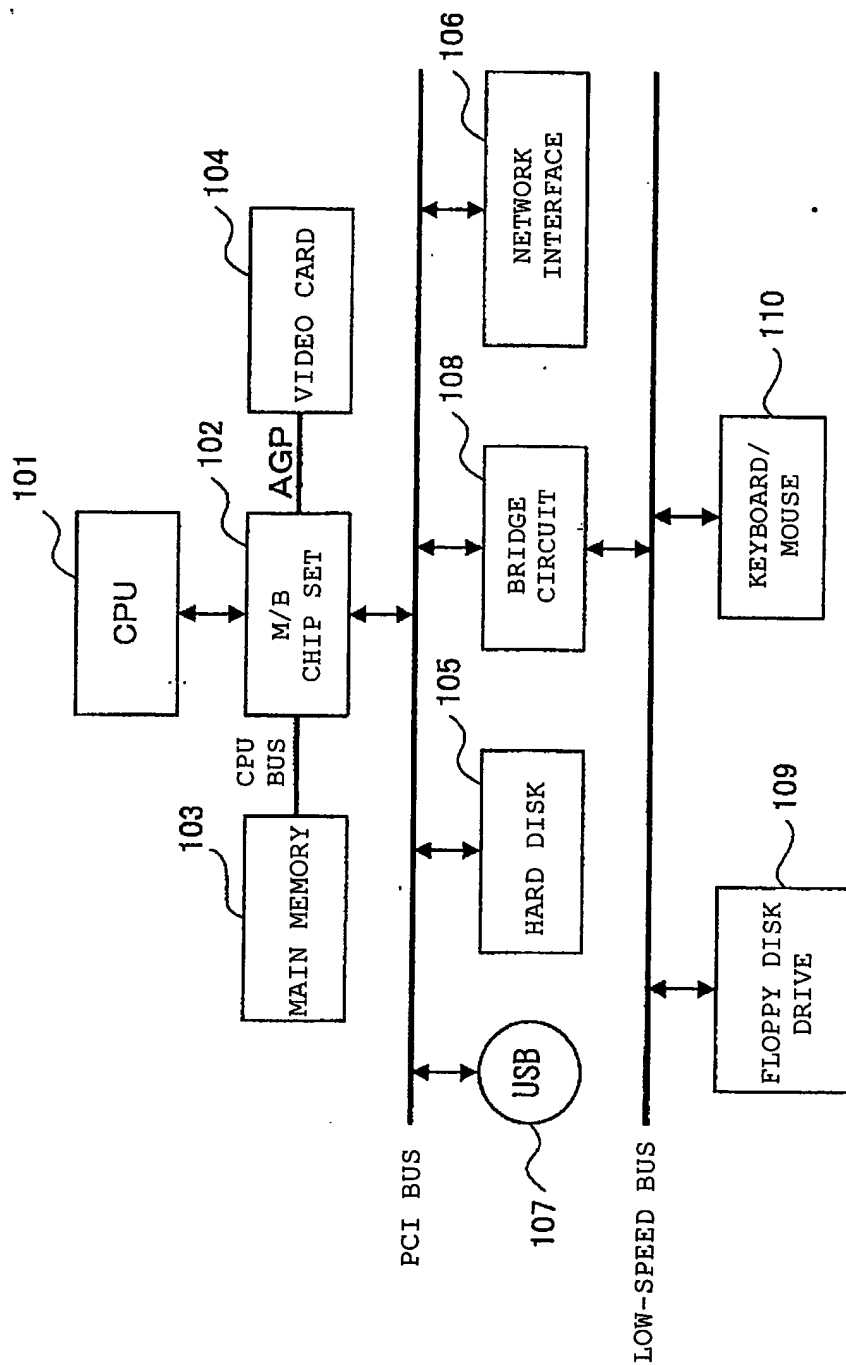


FIG. 2

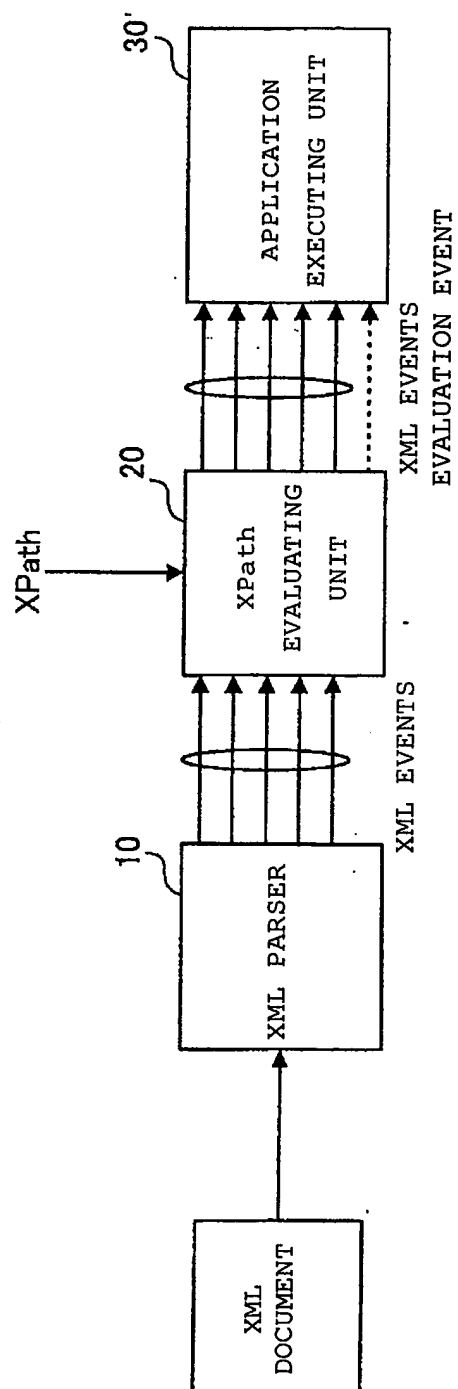


FIG. 3

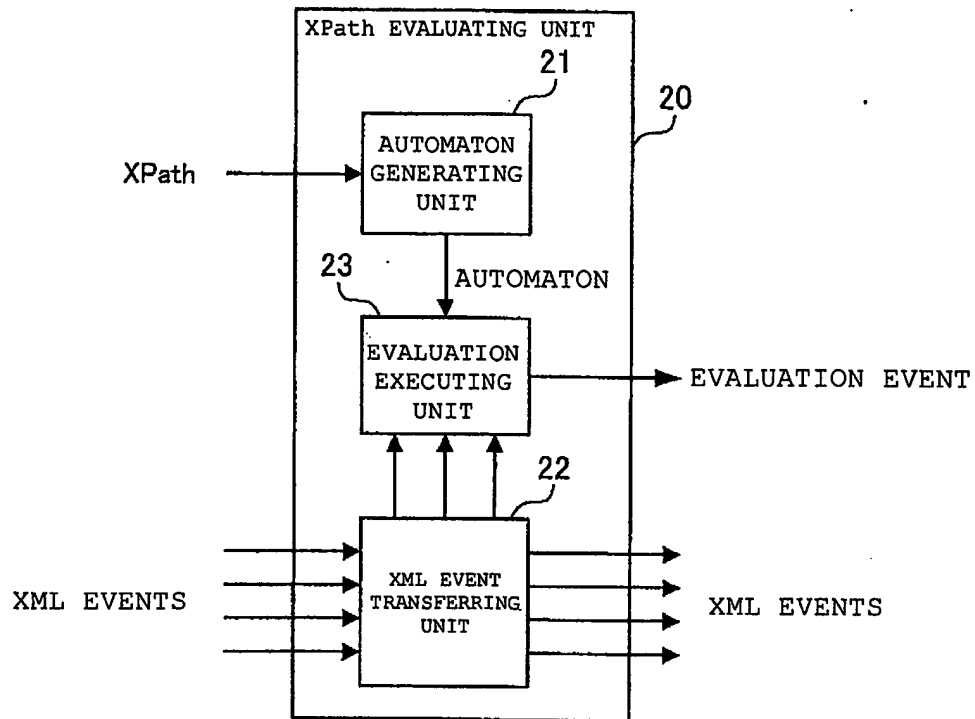


FIG. 4

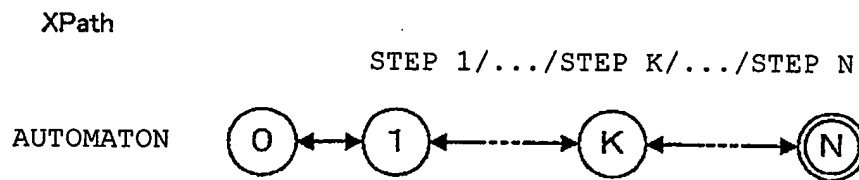
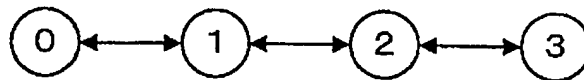


FIG. 5

(A)

STEP 1 STEP 2 STEP 3
/child::document/child::chapter/child::section

(B)



(C)

```
<document>
  <title/>
  <chapter/>
  <chapter>
    <section/>
  </chapter>
</document>
```

FIG. 6

JUDGE STATE OF TRANSITION IN AUTOMATON WITH RESPECT TO XML EVENT

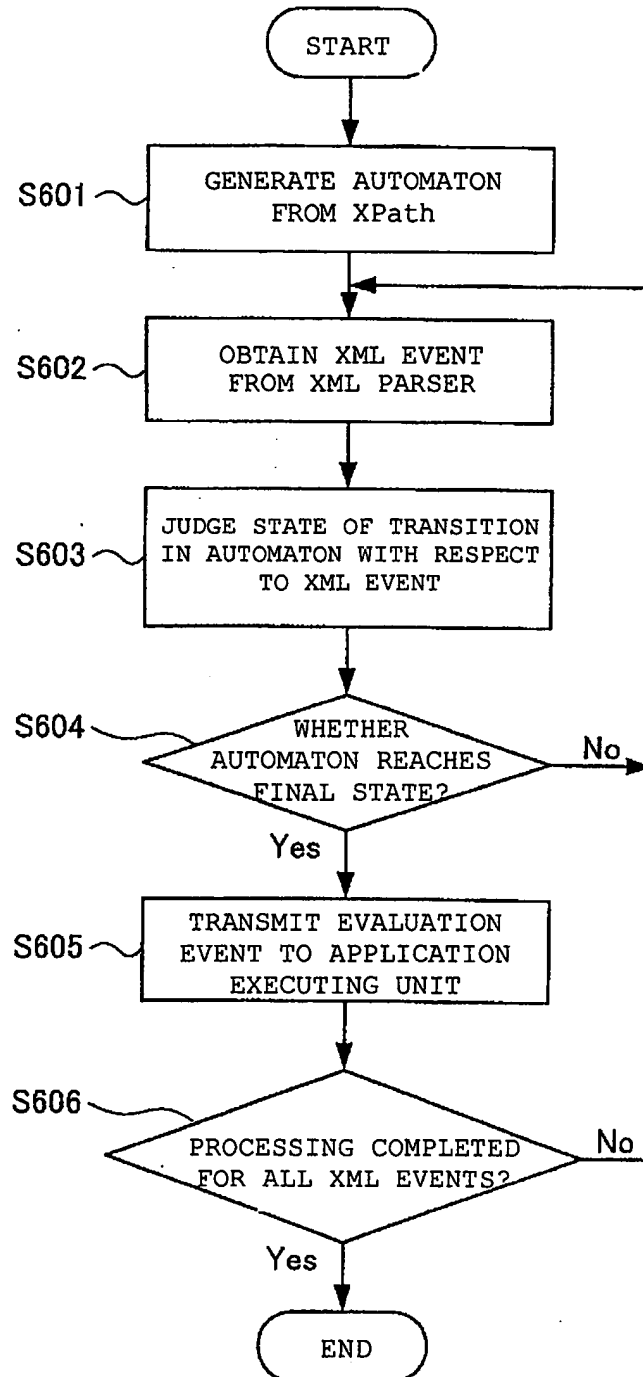


FIG. 7

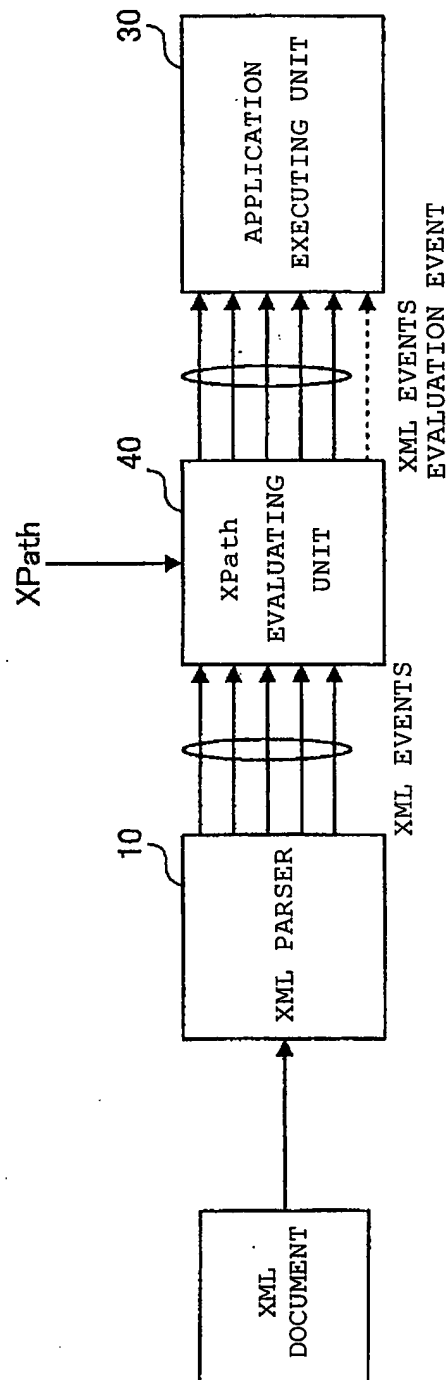


FIG. 8

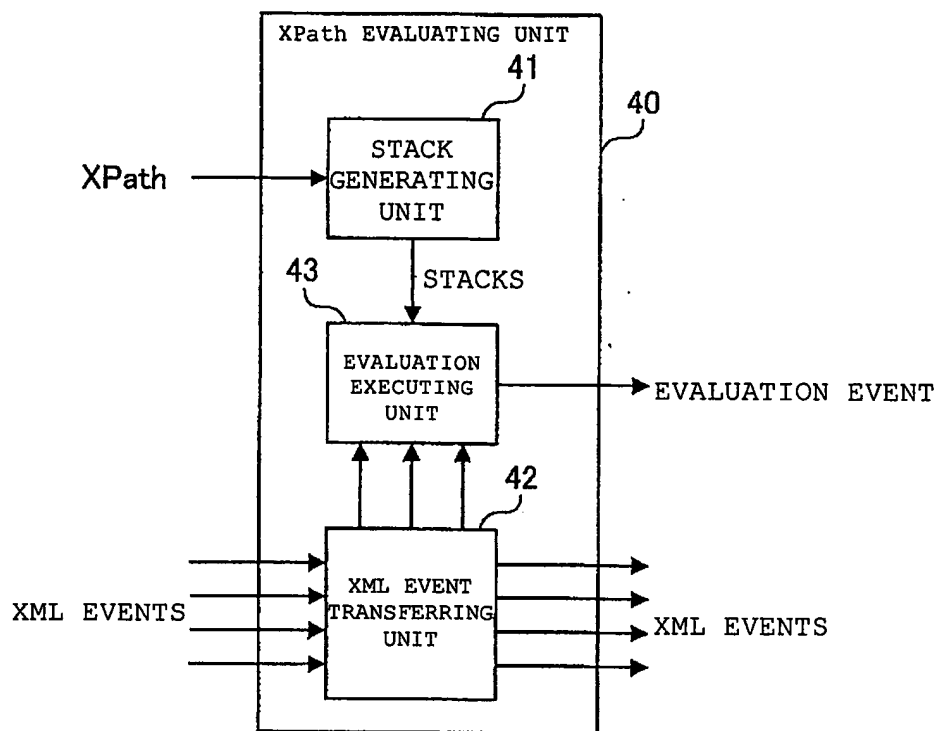
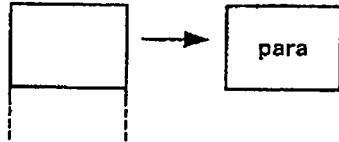
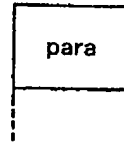


FIG. 9

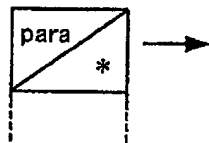
▪ self



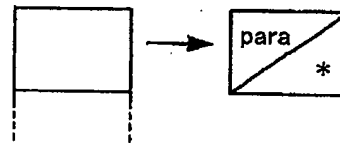
▪ child



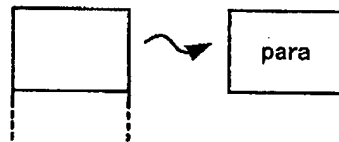
▪ descendant



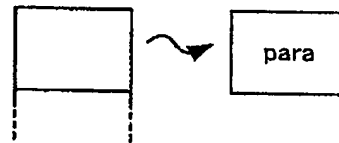
▪ descendant-or-self



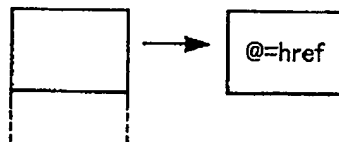
▪ following



▪ following-sibling



▪ attribute



▪ namespace

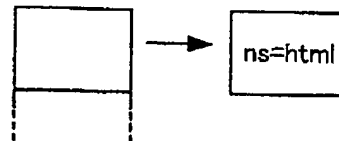
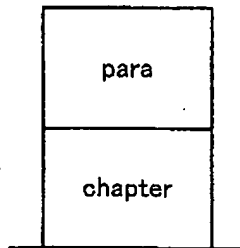
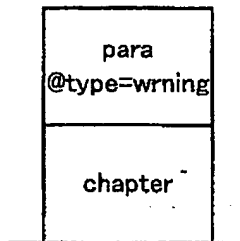


FIG. 10

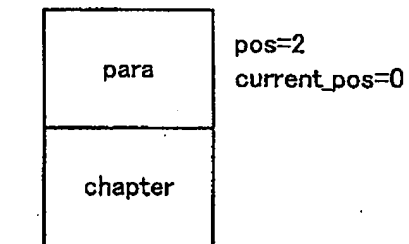
(1) chapter/para



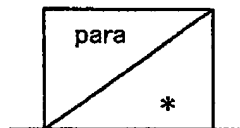
(2) chapter/para[@type="warning"]



(3) chapter/para[2]



(4) . // para



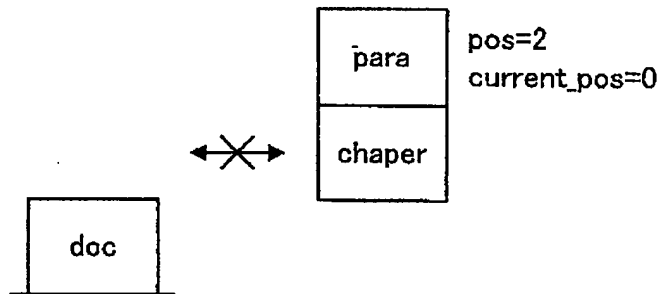
```
<doc>  
  <chapter>  
    <para>xxx</para>  
  </chapter>  
  <chapter>  
    <para>yyy</para>  
  </chapter>  
</doc>
```

(A) startDocument

XML EVENT STRING STACK

STACK FOR XPath

(B) startElement: doc



(C) startElement: chapter

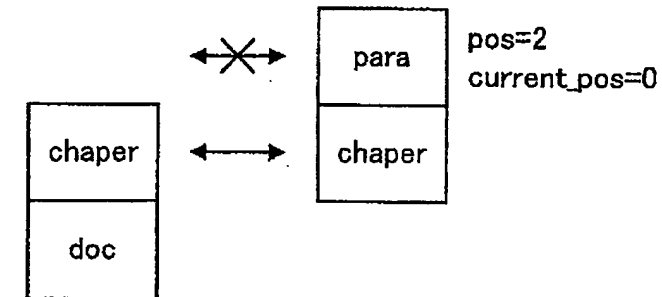
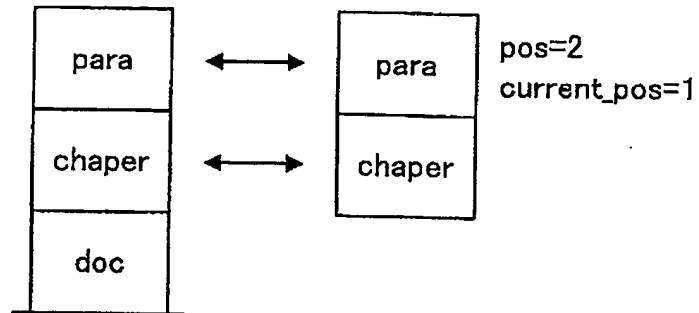
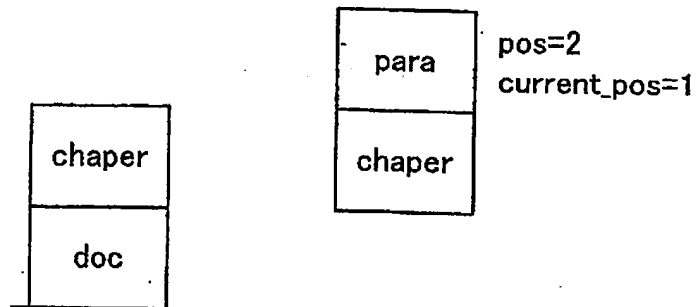


FIG. 13

(A) startElement: para



(B) endElement: para



(C) endElement: chapter

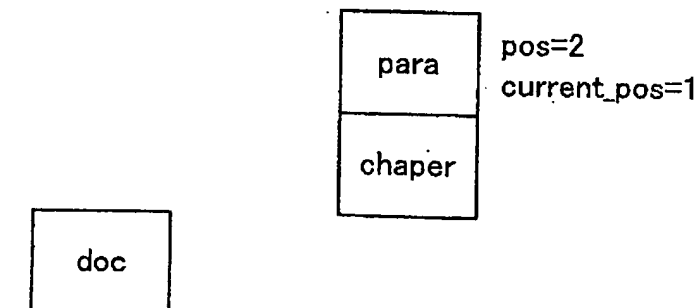
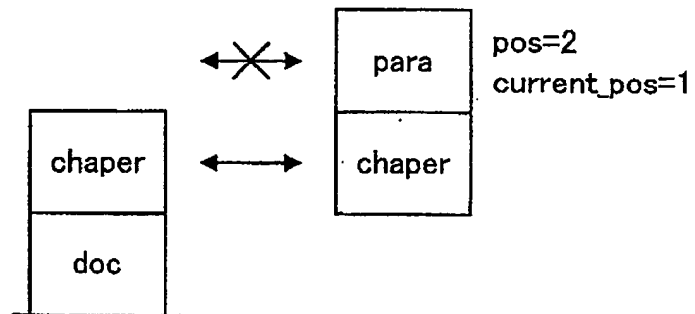


FIG. 14

(A) startElement: chapter



(B) startElement: para

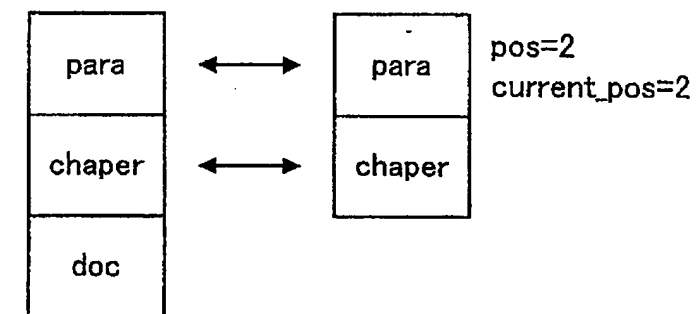


FIG. 15

```
<doc>
  <chap>
    <para num="1"/>
    <para num="2"/>
    <para num="3"/>
  </chap>
</doc>
```

FIG. 16

XPath chap/para[@num="2"]/following-sibling::para



STACK

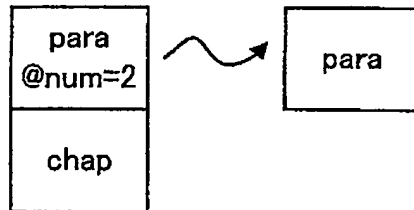


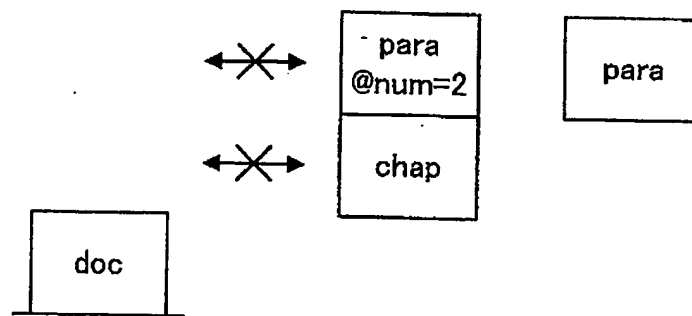
FIG. 17

(A) startDocument

XML EVENT STRING STACK

STACK FOR XPath

(B) startElement: doc



(C) startElement: chapter

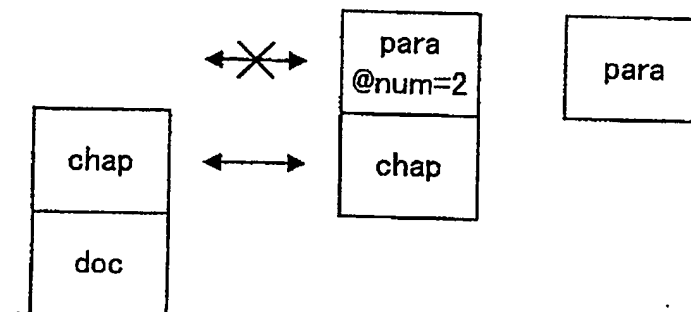
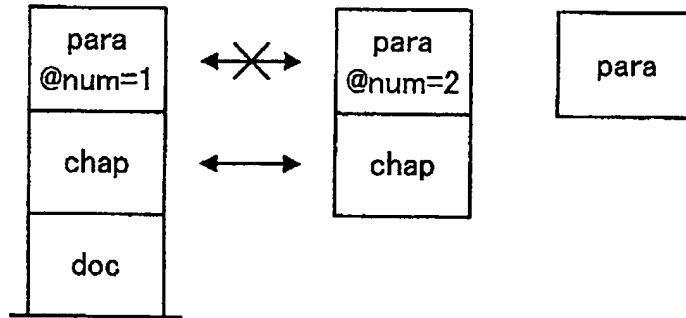
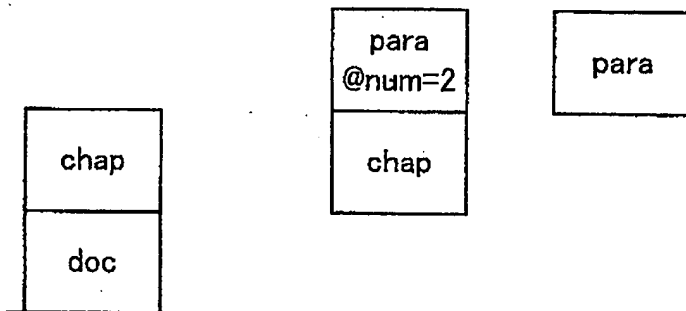


FIG. 18

(A) startElement: para, @num=1



(B) endElement: para



(C) startElement: para, @num=2

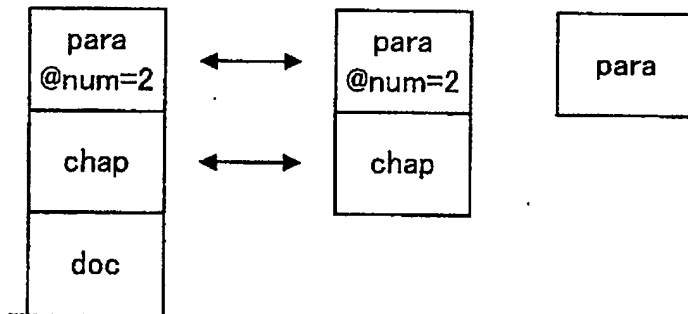
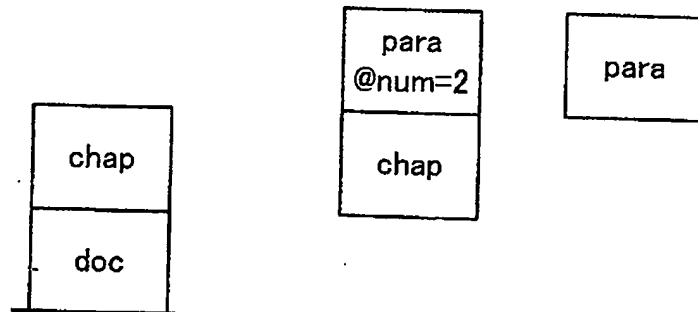


FIG. 19

(A) endElement: para



(B) startElement: para, @num=3

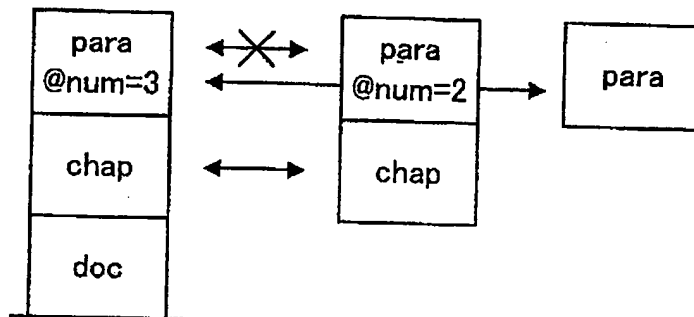


FIG. 20

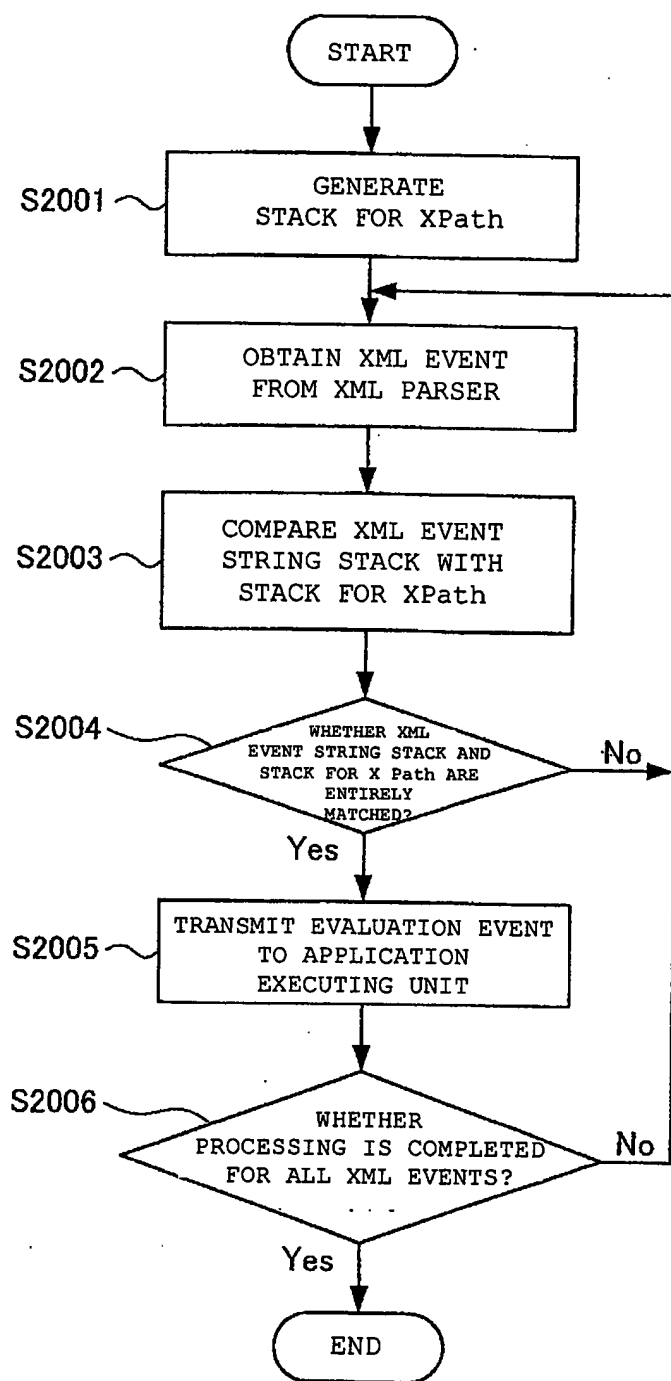


FIG. 21

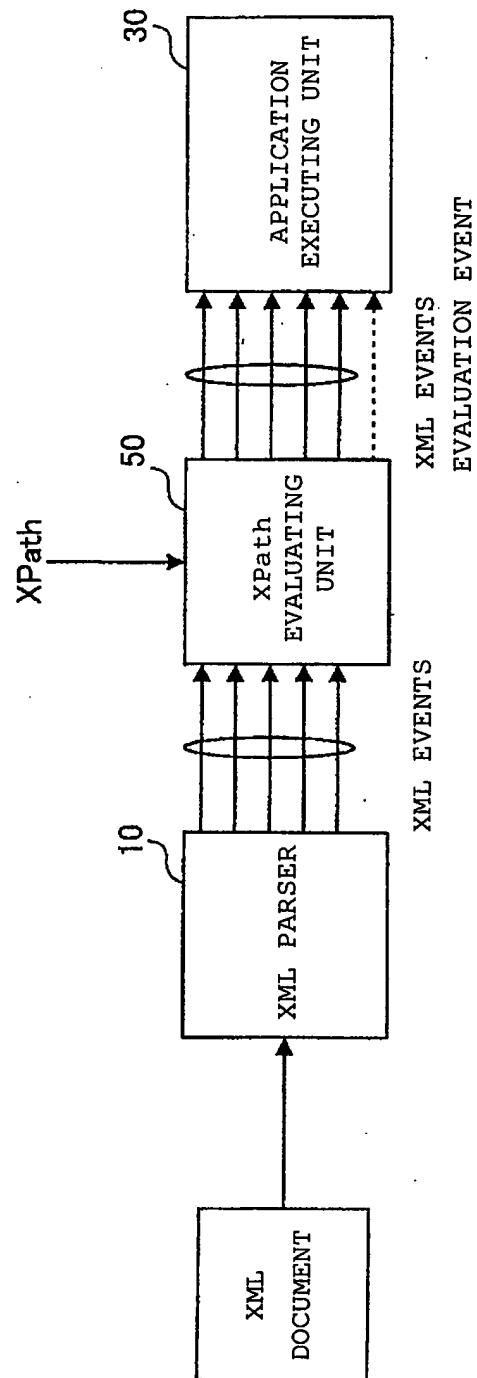


FIG. 22

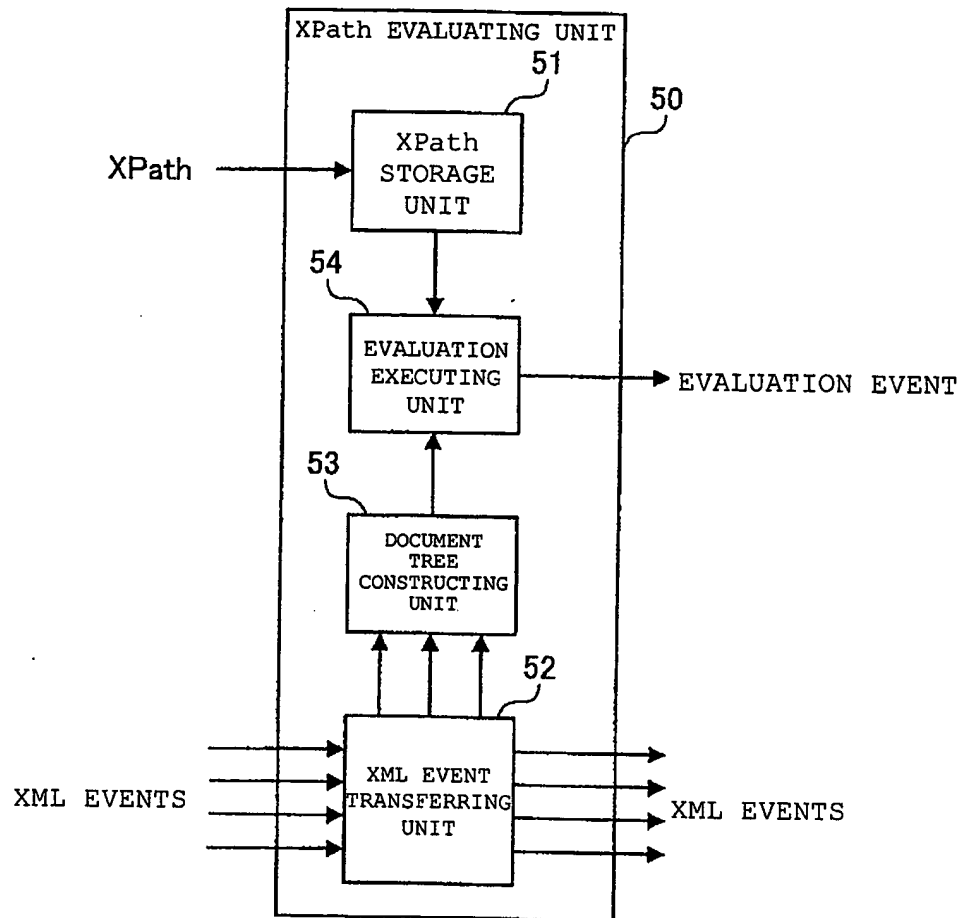


FIG. 23

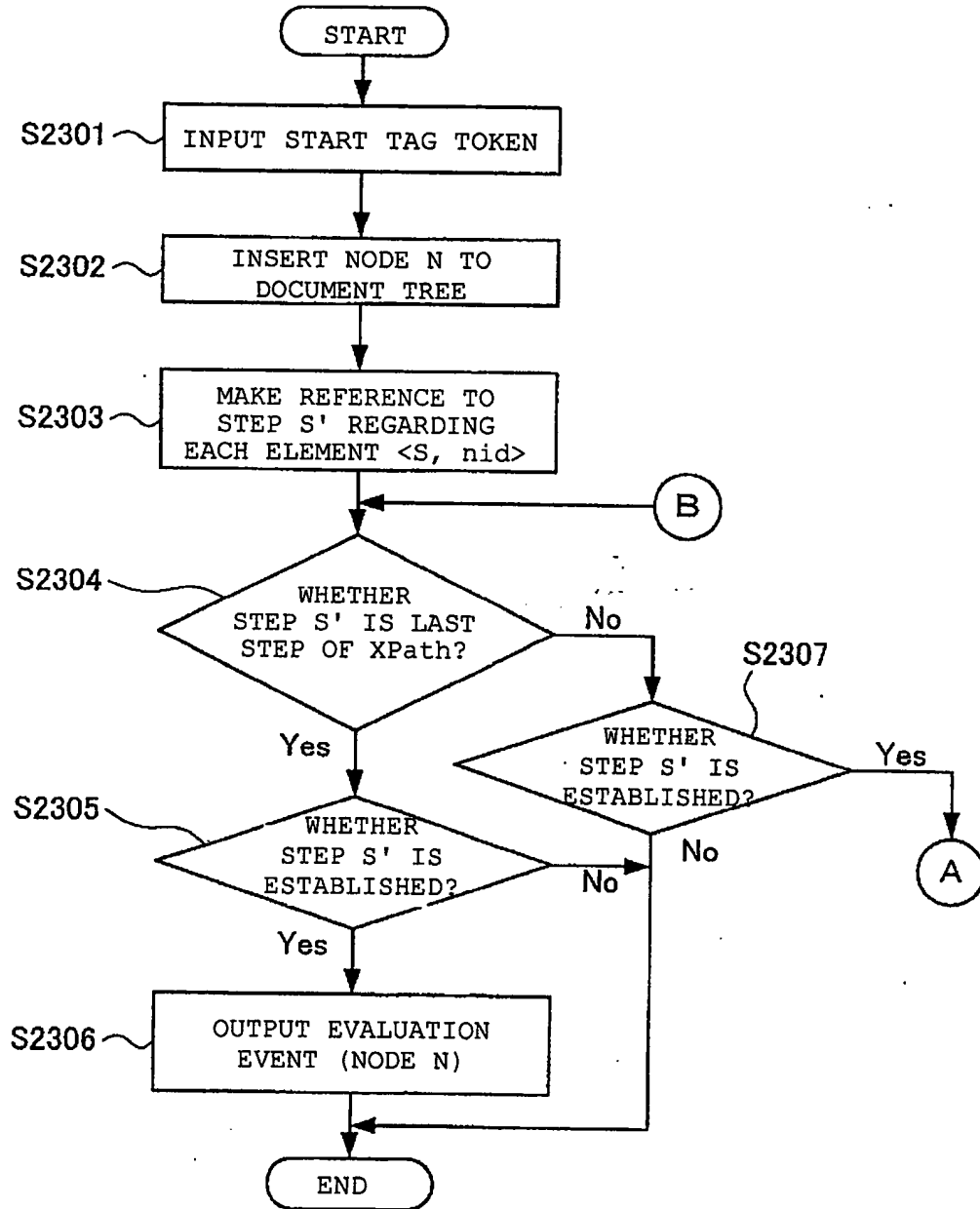


FIG. 24

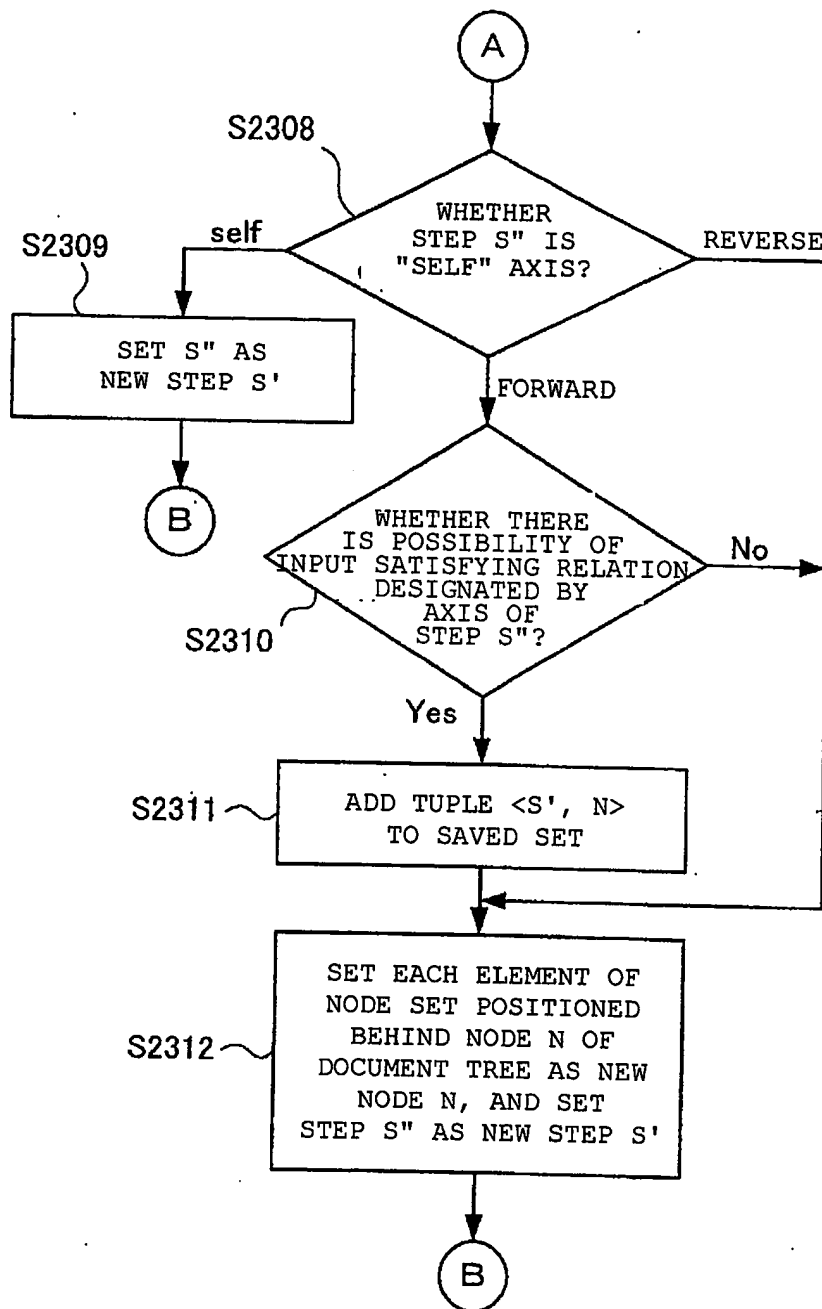


FIG. 25

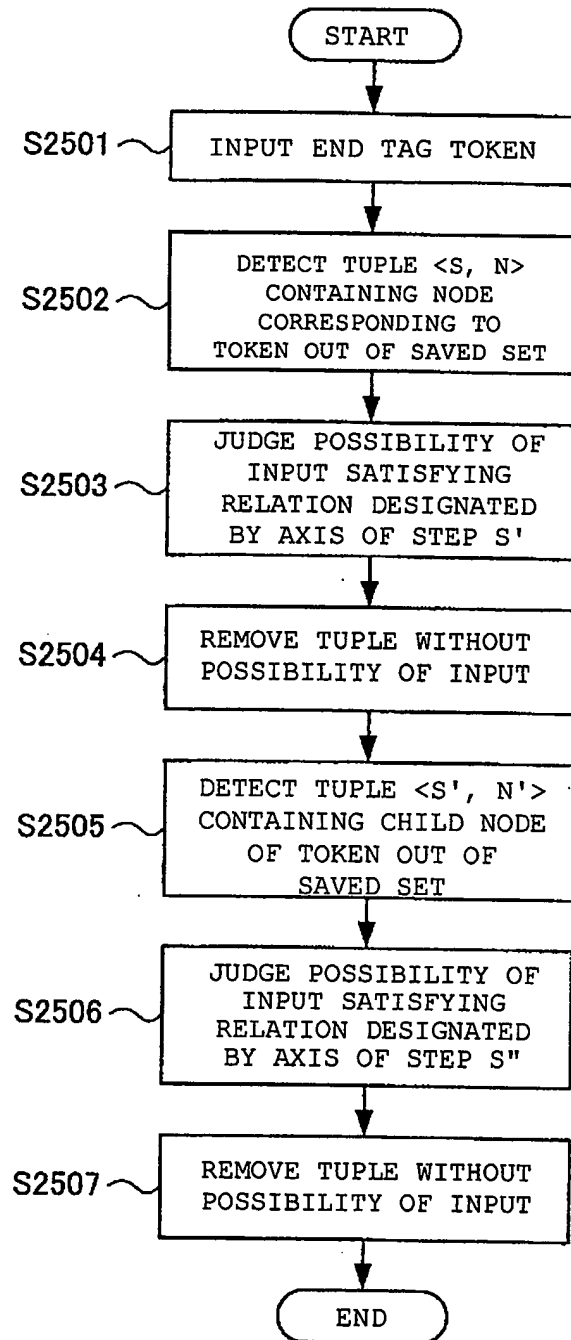


FIG. 26

XML DOCUMENT

```
<a>  
  <c/>  
  <b/>  
  <d/>  
</a>
```

SAX EVENT STRINGS

```
startDocument  
startElement:"a"  
startElement:"c"  
endElement:"c"  
startElement:"b"  
endElement:"b"  
startElement:"d"  
endElement:"d"  
endElement:"a"  
endDocument
```

DOCUMENT TREE

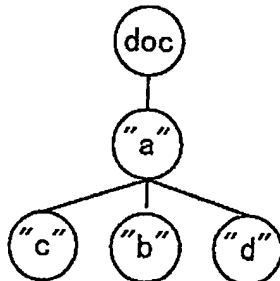


FIG. 27

```

1 2      3      4
"/a/b/preceding-sibling::c/following-sibling::d"

```

startDocument

```

graph TD
    doc((doc))

```

{<0, doc>}

SAX EVENT STRING DOCUMENT TREE SAVED SET

FIG. 28

```

1 2      3      4
"/a/b/preceding-sibling::c/following-sibling::d"

```

```

startDocument
startElement:"a"

```

```

graph TD
    doc((doc)) --- a(("a"))

```

```

[<0, doc>,
 <1, "a">]

```

SAX EVENT STRING DOCUMENT TREE SAVED SET

FIG. 29

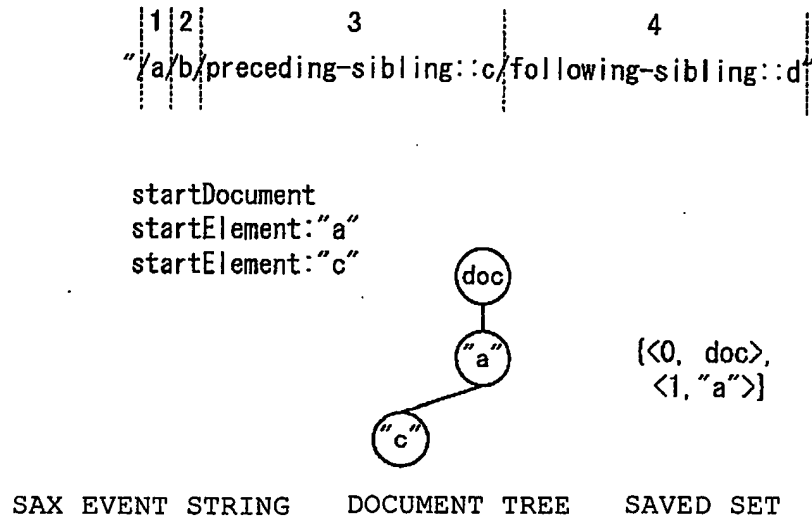


FIG. 30

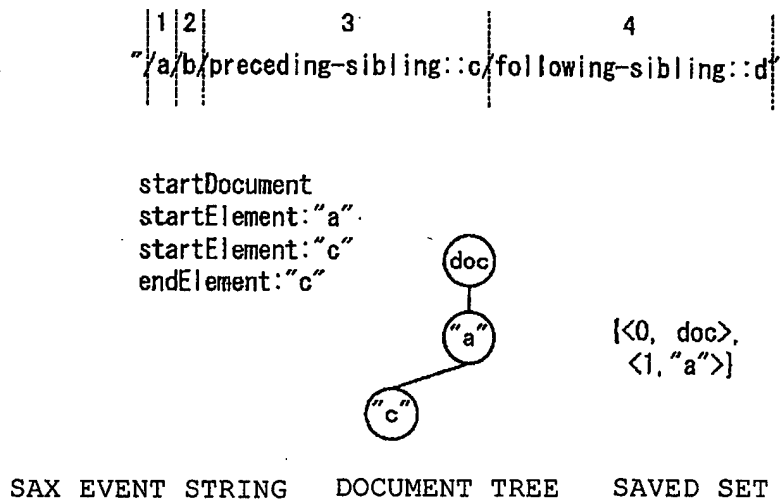


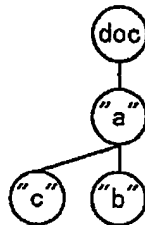
FIG. 31

1	2	3	4
"/a/b/preceding-sibling::c/following-sibling::d"			

```

startDocument
startElement:"a"
startElement:"c"
endElement:"c"
startElement:"b"

```



```

{<0, doc>,
 <1, "a">,
 <3, "c"> }

```

SAX EVENT STRING DOCUMENT TREE SAVED SET

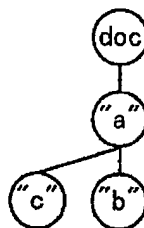
FIG. 32

1	2	3	4
"/a/b/preceding-sibling::c/following-sibling::d"			

```

startDocument
startElement:"a"
startElement:"c"
endElement:"c"
startElement:"b"
endElement:"b"

```



```

{<0, doc>,
 <1, "a">,
 <3, "c"> }

```

SAX EVENT STRING DOCUMENT TREE SAVED SET

FIG. 33

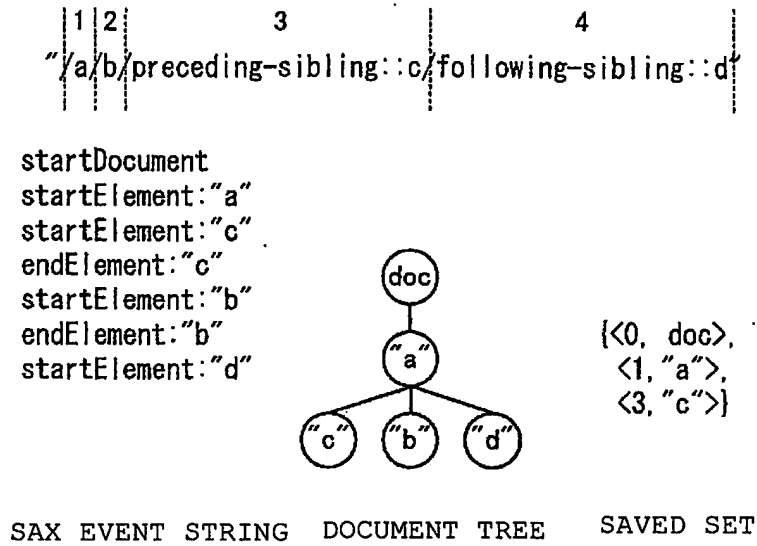


FIG. 34

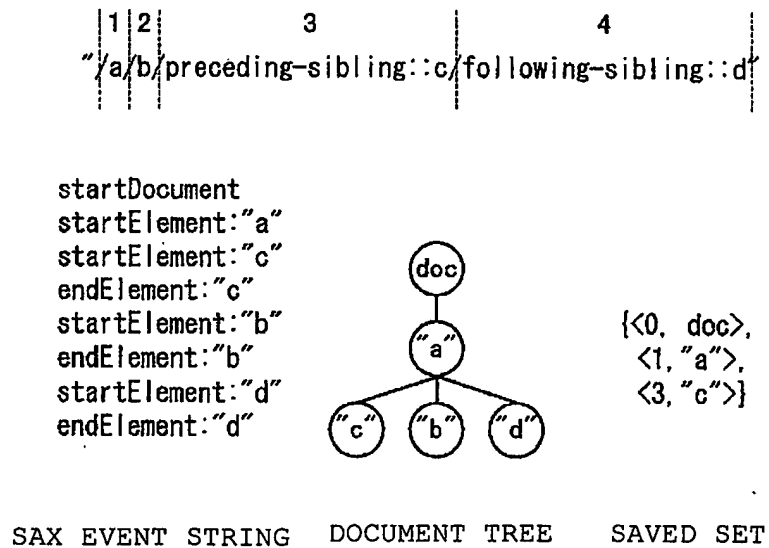


FIG. 35

```

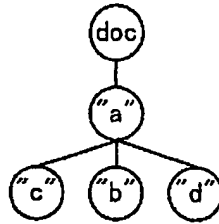
1|2|          3          4
"/a/b/preceding-sibling::c/following-sibling::d"/

```

```

startDocument
startElement:"a"
startElement:"c"
endElement:"c"
startElement:"b"
endElement:"b"
startElement:"d"
endElement:"d"
endElement:"a"

```



[<0, doc>]

SAX EVENT STRING DOCUMENT TREE SAVED SET

FIG. 36

```

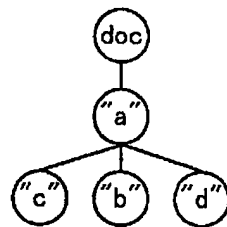
1|2|          3          4
"/a/b/preceding-sibling::c/following-sibling::d"/

```

```

startDocument
startElement:"a"
startElement:"c"
endElement:"c"
startElement:"b"
endElement:"b"
startElement:"d"
endElement:"d"
endElement:"a"
endDocument

```



{ }

SAX EVENT STRING DOCUMENT TREE SAVED SET

FIG. 37

